

# **COVID-19 Update**

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**December 9, 2021**



■ **Epidemiology**

■ **Variants**

■ **Therapeutics**

■ **Pediatric Vaccines**

■ **Booster Shots**

# ■ **Epidemiology**

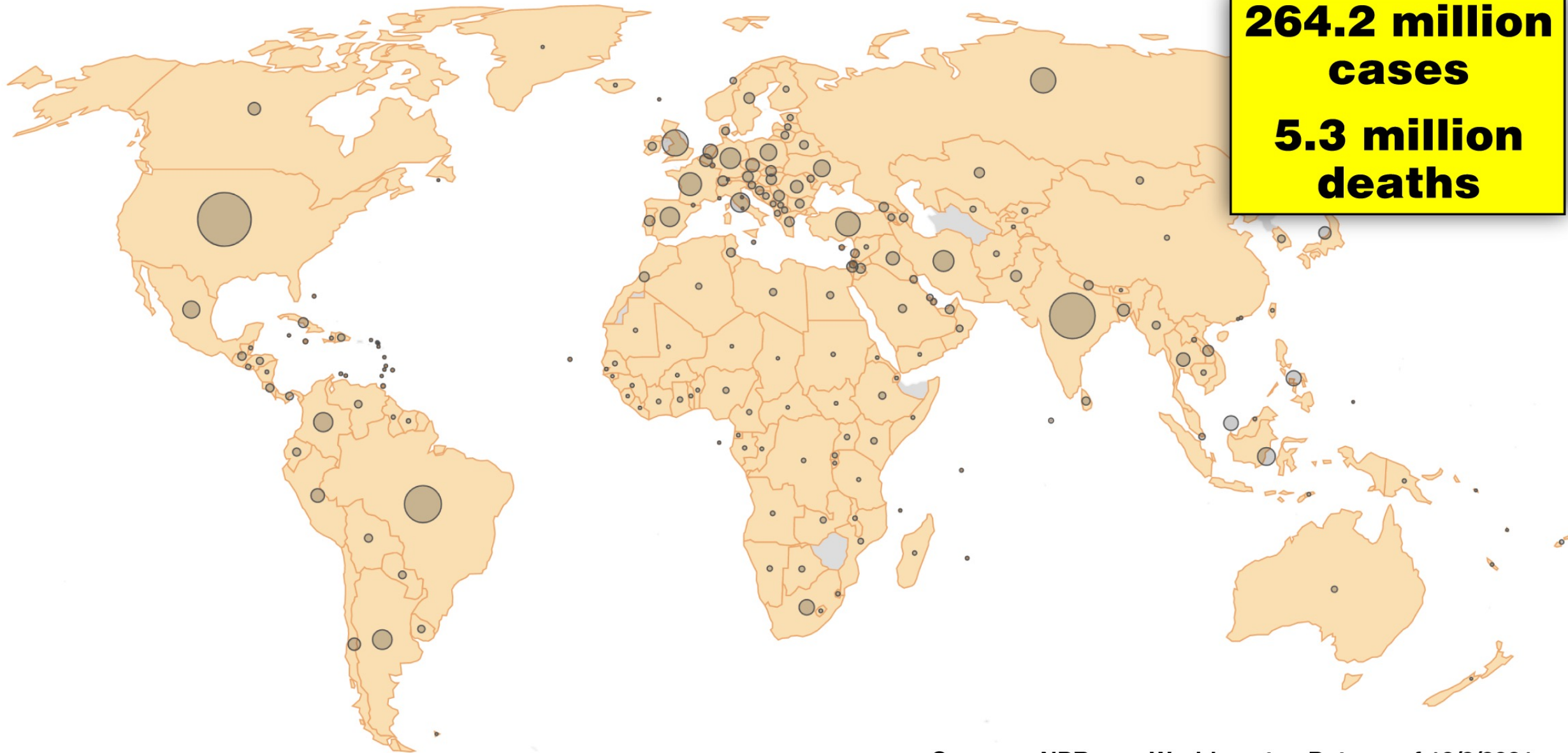
■ **Variants**

■ **Therapeutics**

■ **Pediatric Vaccines**

■ **Booster Shots**

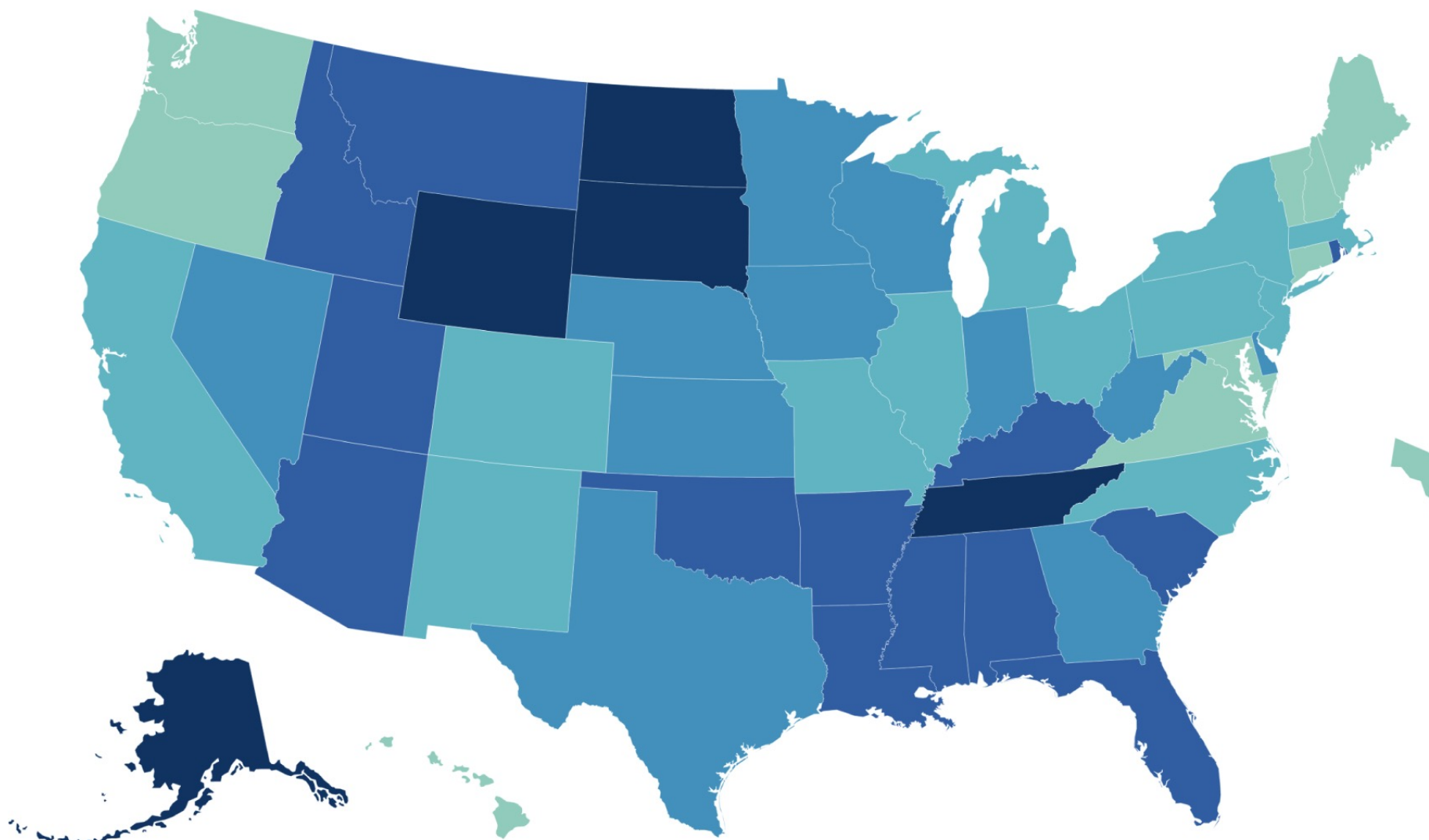
# COVID-19 Globally



Sources: NPR.org; Worldometer. Data as of 12/2/2021.



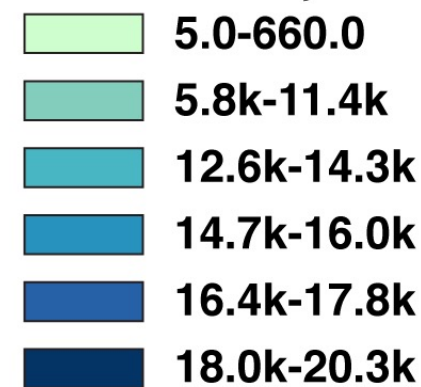
# COVID-19 in the United States



**46.9 million  
cases**

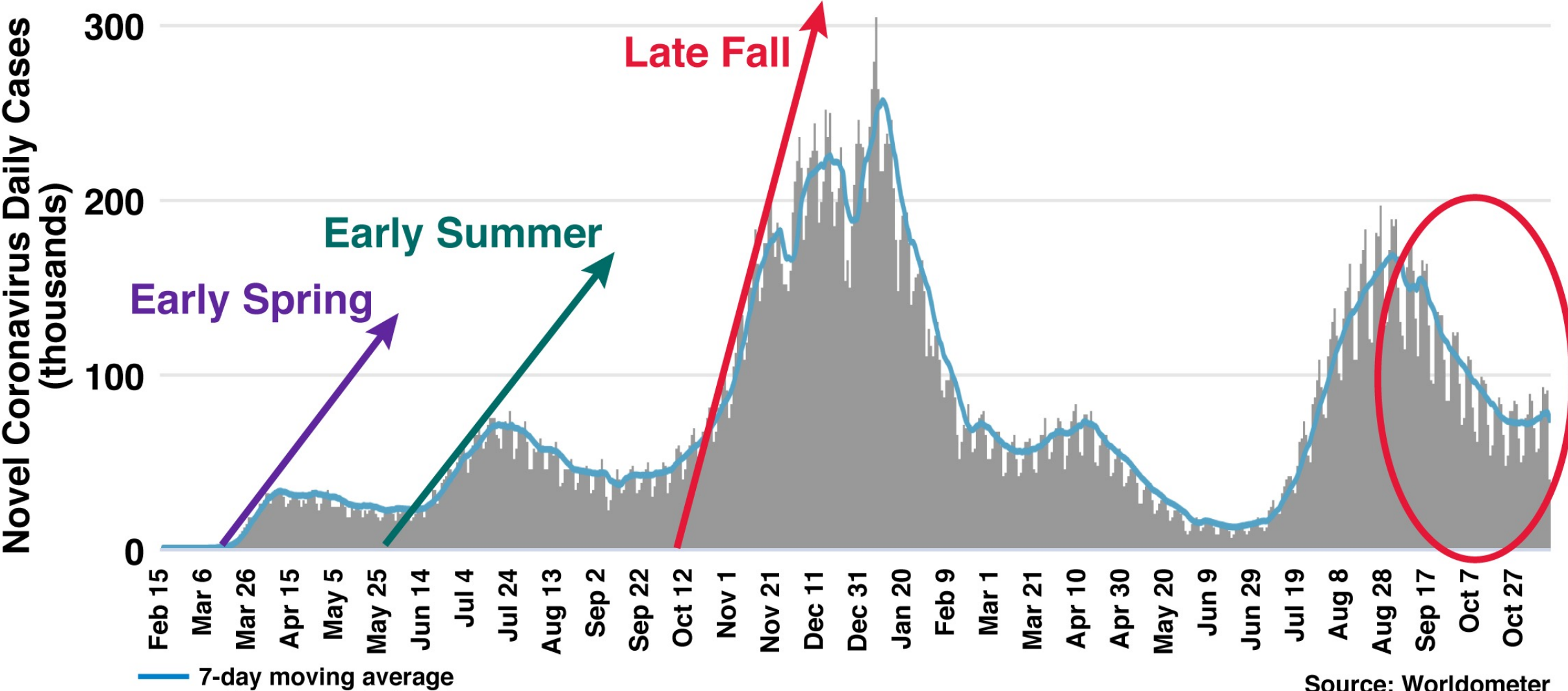
**759,552  
deaths**

## Cases/100,000



Source: CDC. Data as of 11/13/2021.

# Daily New COVID-19 Cases Reported in the United States



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# **WHO SARS-CoV-2 Variants of Concern (VOCs)**

<b>WHO name</b>	<b>PANGO lineage*</b>	<b>Earliest documented samples</b>
Alpha	B.1.1.7	9/2020
Beta	B.1.351	5/2020
Gamma	P.1	11/2020
Delta	B.1.617.2	10/2020
<b>Omicron</b>	<b>B.1.1.529</b>	<b>11/2021</b>

\*VOCs also include descendent lineages

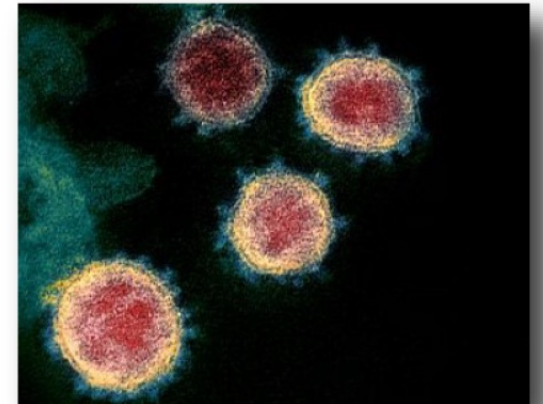
Source: WHO



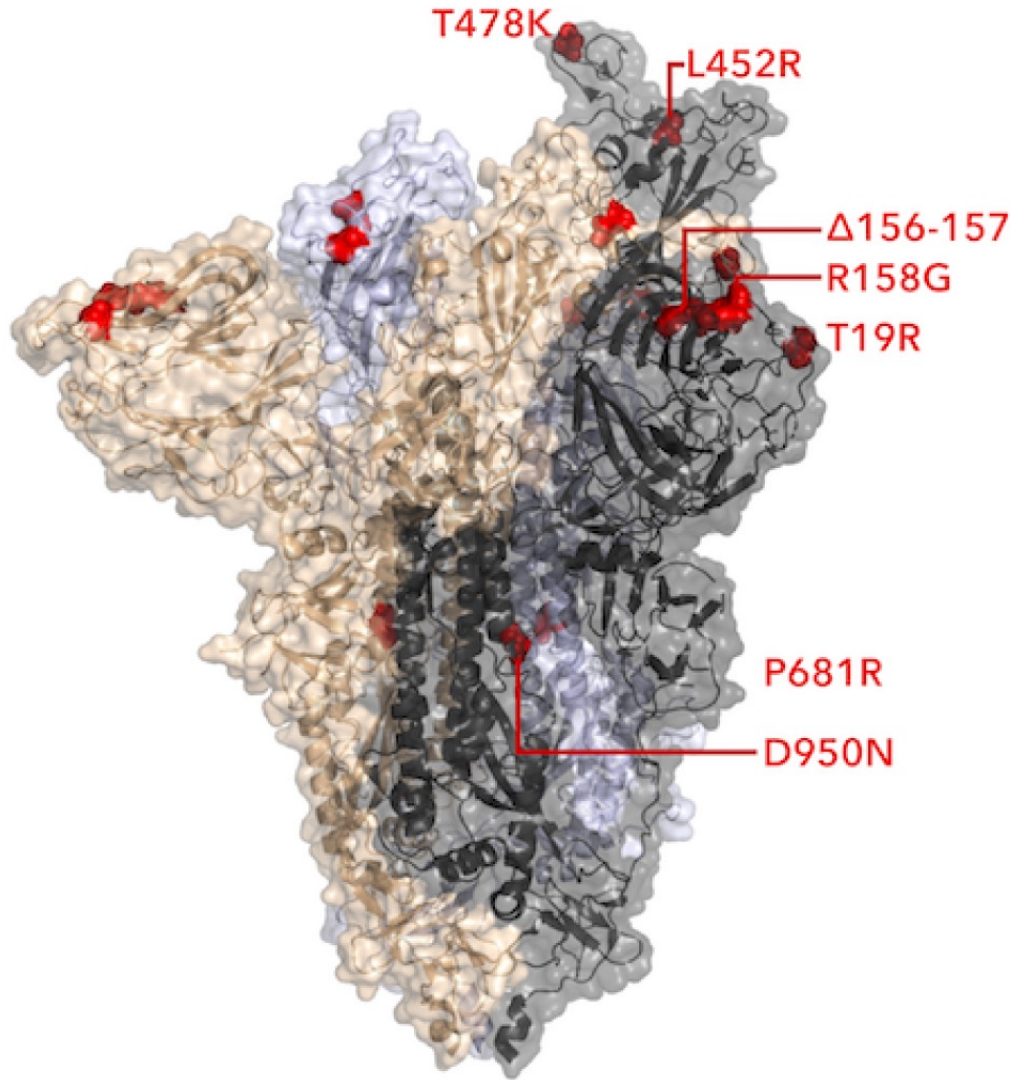
# **SARS-CoV-2 B.1.1.529 (Omicron) Variant**

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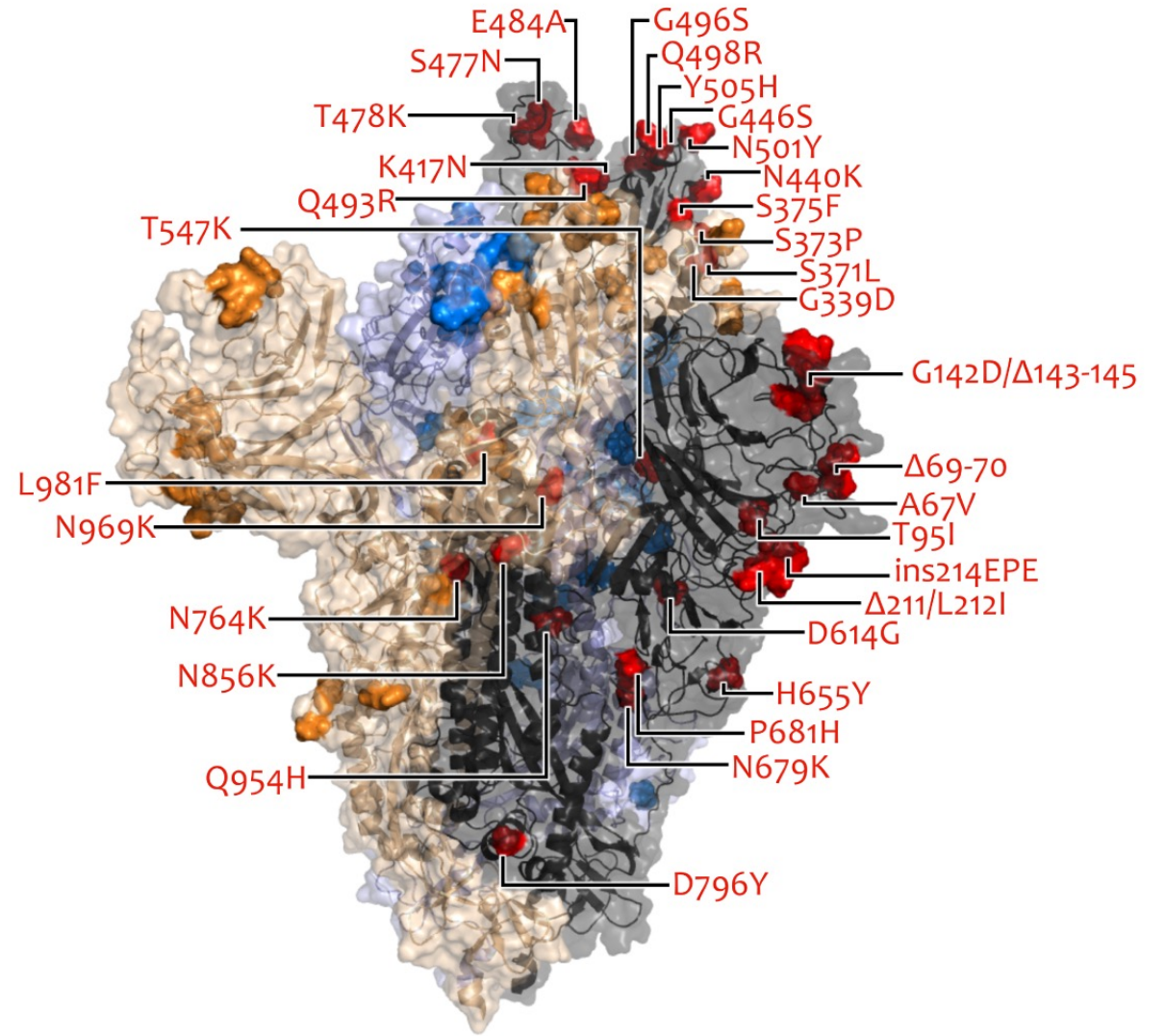
- **Novel variant first reported in Botswana (11/11) and South Africa (11/14)**
- **Larger number of mutations (~50) than previous variants, some anticipated to impact transmissibility and antibody binding**
- **Variant cases rapidly increased in Gauteng province, South Africa, and present in all other S.A. provinces**
- **Confirmed cases (371) now reported from 24 countries (1 in United States)**
- **Called 'Omicron' by WHO and named the fifth SARS-CoV-2 variant of concern on 11/26/2021**



# SARS-CoV-2 Spike Protein Mutations



**Delta**



**Omicron**



# Potential Properties of Omicron\*

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## ■ Transmission

- May have increased transmission compared to the original pandemic virus
- Difficult to infer if more transmissible than Delta

## ■ Vaccine effectiveness

- Significant reductions in neutralizing titer possible
- As with other variants, partial immune escape may occur, but vaccines likely will still protect against severe disease

## ■ Disease severity

- Severity estimates are difficult given small number of cases
- Preliminary information from South Africa suggests no unusual symptoms associated with variant





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Wednesday, December 1, 2021

# **First Confirmed Case of Omicron Variant Detected in the United States**

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# **Molnupiravir: Clinical Data Released Nov. 26, 2021 by Merck and Ridgeback Biotherapeutics**

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- **Placebo-controlled trial; n =1,433**
- **Endpoint: prevention of hospitalization or death**
- **30% decrease in hospitalization/death in treatment arm; 9 deaths in placebo arm, 1 death in treatment arm**
- **FDA Advisory committee voted to approve drug for use in high-risk patients Nov 30, 2021**



# **Paxlovid (Protease Inhibitor + Ritonavir): Clinical Data Announced Nov. 5, 2021 by Pfizer**

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- Placebo-controlled phase 2/3 trial of ~3,000 people; DSMB stopped study early at scheduled interim analysis of 1,219 people
- Subjects with a laboratory-confirmed diagnosis of SARS-CoV-2 infection with mild-to-moderate symptoms and at least one characteristic/medical condition associated with an increased risk of developing severe illness from COVID-19
- Patients randomized (1:1) to receive Paxlovid or placebo orally every 12 hours for five days.
- 89% reduction in hospitalization or death compared to placebo; 10 deaths in placebo arm, no deaths in treatment arm.
- Adverse events similar in placebo and treatment arms



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Tuesday, November 2, 2021

# **CDC Recommends Pediatric COVID-19 Vaccine for Children 5 to 11 Years**

**Today, CDC Director Rochelle P. Walensky, M.D., M.P.H., endorsed the CDC Advisory Committee on Immunization Practices' (ACIP) recommendation that children 5 to 11 years old be vaccinated against COVID-19 with the Pfizer-BioNTech pediatric vaccine.**

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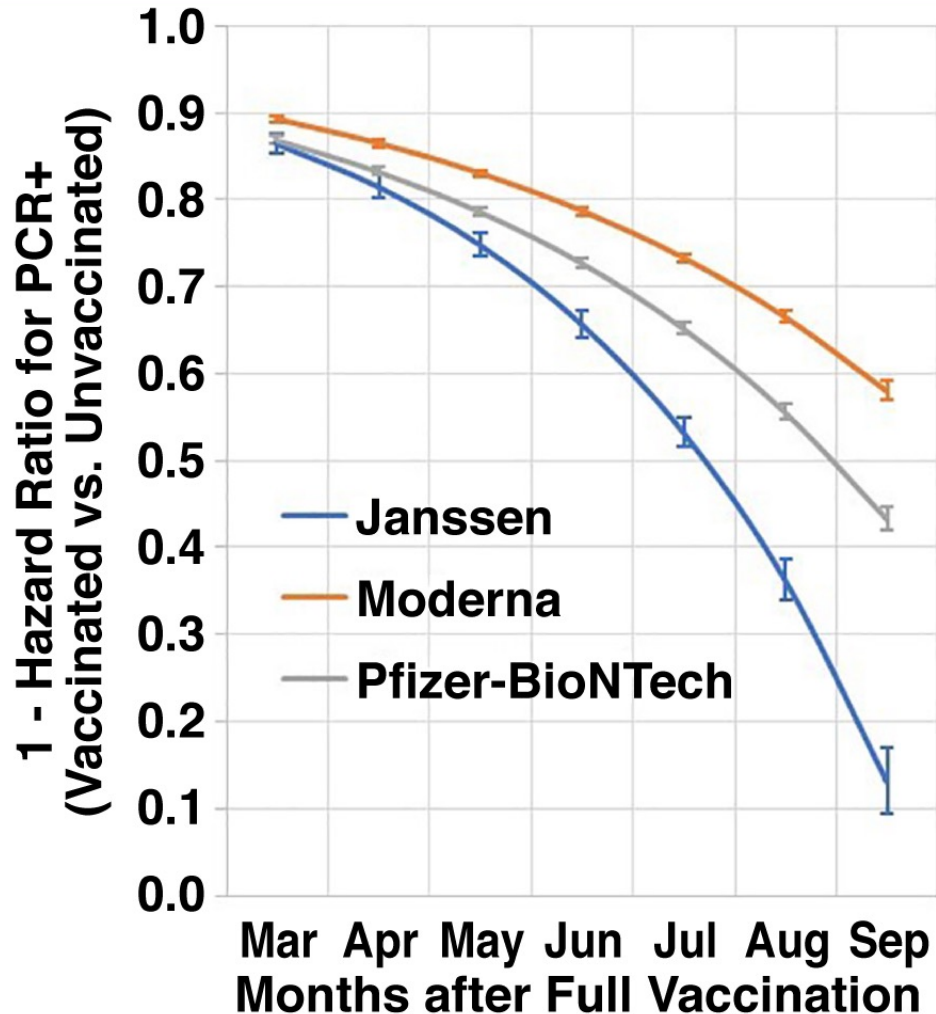
■ **Pediatric Vaccines**

■ **Booster Shots**



# Waning Immunity after COVID-19 Vaccination Among U.S. Veterans, 2021

## Waning immunity against infection

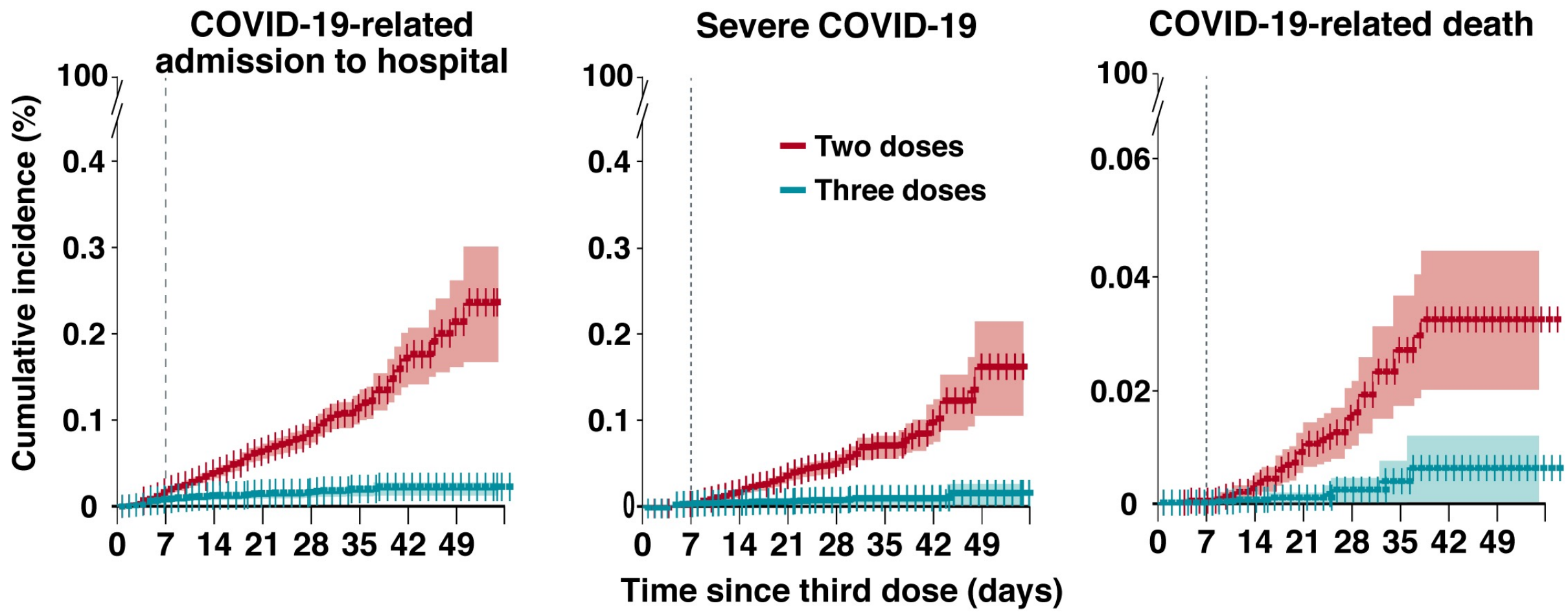


**Vaccine effectiveness (VE) against SARS-CoV-2 infection declined from 87.9% to 48.1% from Feb. to Oct., 2021**

**From July to October 2021 (Delta predominant period), VE against COVID-19 death:**

- age <65 years: 73.0% for Janssen, 81.5% for Moderna, 84.3% for Pfizer-BioNTech
- age ≥65 years: 52.2% for Janssen, 75.5% for Moderna, 70.1% for Pfizer-BioNTech

# Israel: Cumulative Incidence Curves Comparing COVID-19-Related Hospital Admissions, Severe Disease and Death in People Who Received 2 Versus 3 Doses of BNT162b2 Vaccine



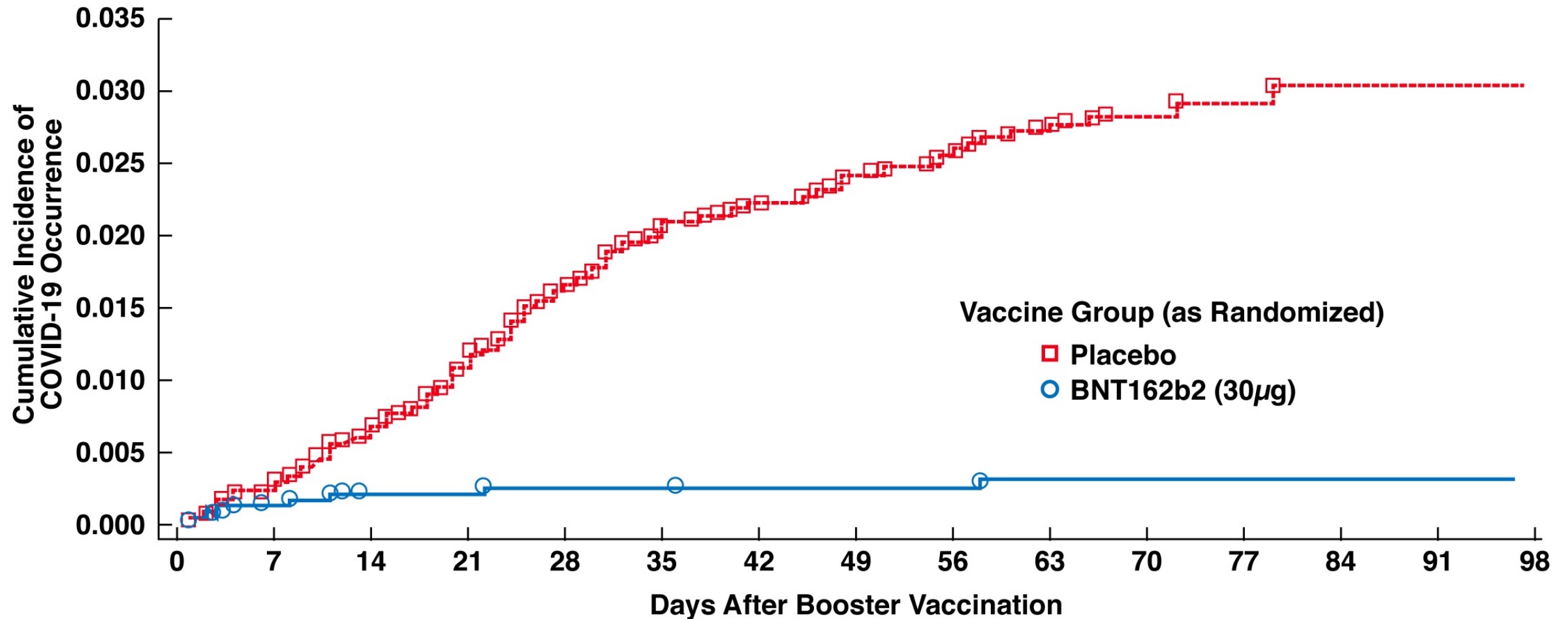


# **Study C4591031: Efficacy & Safety of BNT162b2 Booster**

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- **~10,000 participants  $\geq 16$  years of age in Brazil, South Africa and United States**
- **In 2-month interim analysis, efficacy against symptomatic COVID-19 in the boosted group compared to the unboosted group was 95.6%**
- **Efficacy was consistent irrespective of age, sex, race, ethnicity, comorbid conditions**
- **Adverse events were consistent with those seen in previous studies**

# Study C4591031: Cumulative Incidence Curve for First COVID-19 Occurrence After Booster Vaccination



Source: JL Perez (Pfizer), ACIP meeting, 11/19/2021.

# Every Adult Should Get a Booster Shot

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Monday, November 29, 2021

## **CDC Expands COVID-19 Booster Recommendations**

# **SARS-CoV-2 in 2022: What the Future Holds**

